

# EAB Treatment Guide for Brown County Residents

## Brown County Community Emerald Ash Borer Working Group

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After the catastrophic loss of American elms to the Dutch elm disease in the 1970s, maples and ash dominate our urban landscape, accounting for more than 40% of Wisconsin's urban forest. Unfortunately history sometimes repeats itself; an invasive insect called emerald ash borer (EAB) threatens ash trees in North America. Diversification of tree species is the key in sustaining a healthy urban forest as it prevents the spread of invasive species, a crucial lesson never to be forgotten. EAB was first detected in Green Bay in June 2009 when a single adult was caught in a trap near WPS headquarters, but the established population was not found until recently when ash trees in the same vicinity showed significant tree decline. This is a major threat to all ash trees in Brown County. Because ash trees account for 20-25% of urban trees in Brown County, this crucial finding of EAB population will change the dynamics of our urban landscape in the next 5 to 10 years.

EAB is an exotic beetle from Asia and was first discovered in southeast Michigan in 2002. Since its finding, the beetle has destroyed more than 50 million ash trees in the Midwest region and has been detected in 15 states, including Wisconsin in 2008. So far the killer EAB has been

confirmed in 12 counties in Wisconsin – Brown, Crawford, Kenosha, La Crosse, Milwaukee, Ozaukee, Racine, Rock, Vernon, Walworth, Washington, and Waukesha. Although the beetle typically only flies a short distance (1/2 mile radius per year) to feed and mate, much of its spread is due to movement of infested ash firewood, ash tree nursery stocks, and unprocessed ash logs. To slow the spread across the state, WI DATCP has quarantined the movement of all hardwood firewood in all 12 infested counties as well as Fond du Lac and Sheboygan Counties.



***Emerald Ash Borer***

Only true ash species (*Fraxinus* spp) such as green ash, white ash, blue ash, and black ash are vulnerable to emerald ash borer. In Brown County, green ash (*Fraxinus pennsylvanica*) and white ash (*Fraxinus americana*) are the most common ash species. The key to I.D. an ash tree is to notice the opposite arrangement pattern of

its branches and bud and look for its compound leaves containing 5–11 leaflets. To ensure proper identification of ash trees, homeowners are encouraged to bring a live sample or photographic specimen of the tree leaves and its branches to the Brown County UW Extension Office. Note that mountain ash (*Sorbus* spp) and prickly ash (*Zanthoxylum americanum*) are not true ash and will not be susceptible to EAB.

Emerald ash borer is a small metallic green beetle about 3/8" to 1/2" long and 1/16" to 1/8" wide that emerges from the inner bark from late May until September, creating a D-shaped exit hole. Its

emergence peaks between mid-June until early July, especially during warm sunny days. A female beetle lays 30-90 eggs underneath the bark crevices, and the eggs hatch in about 7 to 10 days. The adult beetles



**Larva**

have a short life and survive only for about 3 to 6 weeks.

After the egg hatches, a tiny creamy white colored larva immediately begins

chewing through the bark and feeds on the inner bark tissue for several weeks. This is the destructive stage of the beetle's life cycle, disrupting the movement of nutrients and water uptake to the tree. A full grown larva averages about 1.5" in length and has a series of bell-shaped body segments. While feeding, the larva creates a distinct serpentine gallery packed with its own frass (waste + sawdust). Larvae can reside inside the healthy bark for a year or two and begin to overwinter in late autumn in the feeding tunnels that they create on the outer sapwood. Transformation from the larva into the adult (pupation) occurs over the winter months (November to early May) and the adult beetle emerges in late May. Typically EAB has a one year life cycle.

EAB attacks both healthy and stressed ash trees. When populations are high, it can kill large ash trees

## Symptoms to watch for:

**Crown dieback** – Canopy thinning and dieback of branches on the upper and outer region of the crown.



**Epicormic sprouts** –

Excessive shoot growth (suckers) arise from the lower trunk and at the base of the tree.



**Bark split** – Vertical fissure on the outer bark revealing larval feeding galleries beneath.



**Woodpecker damage** – Sensing the larval presence underneath the bark, a woodpecker strips pieces of bark (flecking) and excavates holes on the trunk.

## Signs of EAB:



**D-shaped exit hole** – As the adult beetle emerge from underneath the bark in June and July, it creates a D-shaped hole approximately 1/8" in diameter.



**Serpentine galleries** – When loose bark is peeled, distinct S-shaped feeding galleries packed with frass (waste) can be noticed underneath.

in less than 3 years and smaller ash trees within 2 years. However, at low population densities or in a newly infested tree, detecting EAB can be very challenging because the symptoms are often subtle and occur mostly on the top crown region of the tree. As its density builds to moderate or high, external symptoms become more prominent. When checking for EAB presence on an ash tree, it is important to consider at least two or more combinations of signs and symptoms.

### **What you can do?**

#### **A) Prevention & diversification:**

- 1) To limit the spread of EAB, do not move any hardwood firewood, ash nursery stock, unprocessed wood waste from pruning, removal of storm damage, ash bark, and wood chip mulch that are more than 1" size out of Brown County.
- 2) Do not plant ash trees in the landscape. Diversify with alternatives to ash and maple such as Kentucky coffee tree, ginkgo, baldcypress, Turkish filbert, swamp white oak, chinkapin oak, dutch elm disease resistant hybrid elms, disease resistant crab apples, Japanese tree lilac, or apple serviceberry. To learn more about alternatives to ash, please visit [www.emeraldashborer.wi.gov](http://www.emeraldashborer.wi.gov)

#### **B) Treatment options:**

Homeowners living in Brown County or within a 15 mile radius from Green Bay can treat their high value ash trees using a systemic insecticide which is up taken by tree roots. However, several factors influence the effectiveness of the insecticide including the cost of the treatment and the pre-existing health condition of the tree. In general:

- 1) Insecticidal treatments are most effective as a preventive strategy on healthy ash trees

that have a full crown and intact bark on its branches and trunk.

- 2) Ash trees that are already infected with EAB and exhibit less than 50% canopy dieback can still opt for insecticide treatment. Any signs of its recovery can be noticed in the second year after treatment. However trees that have lost more than 50% canopy may not recover from its decline. Thus, insecticide treatments are not suggested.
- 3) Most insecticidal products recommended for homeowners need annual application and are applied as a soil drench. The best timing for soil drench application depends on the size of the tree. To determine the amount of insecticide to apply, simply measure the circumference of the tree using a tape at a chest height at 4.5' above the ground to figure out the size of the tree. Trees less than 47" circumference are best treated in early spring (mid-April to mid-May) and larger trees (greater than 47" circumference) are best treated either in fall (September) or spring (mid-April to mid-May). Research findings suggest that spring insecticide treatments are favored over fall, however fall applications are acceptable.



***Soil Drenching***

- 4) The following systemic insecticides containing imidacloprid as the active ingredient are effective as a soil drench in treating ash trees less than 47" circumference: Bayer Advanced Tree and Shrub Insect Control, Ferti-lome Systemic Tree and Shrub Drench, Optrol, Bonide Tree and Shrub Insect Control, Ortho Max Tree and Shrub Insect Killer, and Gordon's Tree and Shrub Insect Killer.
- 5) Be sure to read the product label to determine the rate of application and safety protocols. Before drenching, rake up any mulch, leaf litter or landscape cloth around the base of the tree trunk to about 18-24" to facilitate a direct contact of the insecticide with the soil. The soil needs to be in moist condition at the time of application. If the soil is very dry, irrigate around the base of the tree a few hours prior to insecticide application or if the soil is too wet, allow it to dry out for few days. Measure the volume of application needed as directed in the label and slowly pour the solution around the base of the tree trunk. Replace the mulch after the solution is completely absorbed in the soil. Click on the YouTube video link below for a detailed demonstration on soil drench application:  
<http://www.hort.uwex.edu/articles/protecting-your-tree-emerald-ash-borer>
- 6) Trees larger than 47" circumference can still be drenched by the homeowner using Optrol (imidacloprid), or contact professionals for other treatments. You can find the list of certified arborists for hire at <http://www.isa-arbor.com/faca/findArborist.aspx>
- 7) Professionals have access to additional products with unique application techniques. A trunk injection technique with Treeäge (emamectin benzoate), a restricted use product (RUP) available only to certified and licensed applicators, has quicker uptake by the tree (irrespective of soil condition) and is effective for at least 2 years. However, trunk injection can create wounds on the tree and repeated applications can cause potential injury. Other products that can be applied via trunk injection method are IMA-jet (Imidacloprid), Imicide (Imidacloprid), Inject-A-Cide B( Bidrin), Pointer (Wedgle). Soil injection is another method of treatment by professionals where the products (Merit, Xytect) are applied within 18" of the trunk and placed between 2" to 4" beneath the soil surface.
- 8) The treatments are typically cost prohibitive in woodlot areas or for large numbers of ash trees in communities.



**Adult Beetle**

**Note:** University of Wisconsin Extension does not endorse any one specific insecticide listed in this article. Products discussed in the article have been evaluated in a variety of Michigan State University research tests on EAB.

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